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C L A I M S

1. A feedback control method of performing
disturbance recovery control by giving a manipulated
variable to a controlled system so as to make a
controlled variable recover to a set point at the time
of application of a disturbance, characterized by
comprising:

the step of dividing a response process of
disturbance recovery control into three stages including
a follow-up phase, a convergence phase, and a stable
phase;

the first phase switching step of switching to
the follow-up phase at a disturbance application
detection time point as a start time point of the
follow-up phase;

the follow-up phase manipulated variable
determination step of continuously outputting a
manipulated variable which makes the controlled variable
follow up the set point in the follow-up phase;

the second phase switching step of switching
to the convergence phase at a disturbance recovery
control elapsed time point, as a start time point of the
convergence phase, at which the controlled variable does
not exceed the set point in the follow-up phase;

the convergence phase manipulated variable
determination step of continuously outputting a
manipulated variable which makes the controlled variable

27 converge near the set point in the convergence phase;
28 the third phase switching step of switching to
29 the stable phase at a time point, as a start time point
30 of the stable phase, at which a preset state is reached
31 in the convergence phase; and
32 the stable phase manipulated variable
33 determination step of continuously outputting a
34 manipulated variable which makes the controlled variable
35 stable at the set point in the stable phase.

2. A feedback control method according to
2 claim 1, characterized in that the first phase switching
3 step comprises the step of setting a time point, as the
4 start time point of the follow-up phase, at which it is
5 confirmed on the basis of a deviation between a set
6 point and a controlled variable that a disturbance has
7 been applied.

3. A feedback control method according to
2 claim 1, characterized in that the first phase switching
3 step comprises the step of setting a time point, as the
4 start time point of the follow-up phase, at which a
5 phase switching signal is input from an external unit
6 which notifies application of a disturbance.

4. A feedback control method according to
2 claim 1, characterized in that the second phase
3 switching step comprises the step of calculating a
4 predicted value of a remaining time for attainment which
5 is a time taken for a current controlled variable to

reach the set point in the follow-up phase, on the basis of a deviation between the set point and the controlled variable and a controlled variable change ratio, and the step of setting a time point, as the start time point of the convergence phase, at which the calculated predicted value of the remaining time for attainment becomes smaller than a preset time index.

5. A feedback control method according to claim 1, characterized in that the third phase switching step comprises the step of setting a time point, as the start time point of the stable phase, at which a preset time index has elapsed.

6. A feedback control method according to claim 1, characterized in that the follow-up phase manipulated variable determination step comprises the step of continuously outputting a preset manipulated variable.

7. A feedback control method according to claim 1, characterized in that the convergence phase manipulated variable determination step comprises the step of continuously outputting a preset manipulated variable.

8. A feedback control device for dividing a response process of disturbance recovery control into three stages including a follow-up phase, a convergence phase, and a stable phase and performing disturbance recovery control by giving a manipulated variable to a

6 controlled system so as to make a controlled variable
7 recover to a set point at the time of application of a
8 disturbance, characterized by comprising:

9 a first phase switching unit which switches to
10 the follow-up phase at a disturbance application
11 detection time point as a start time point of the
12 follow-up phase;

13 a second phase switching unit which switches
14 to the convergence phase at a disturbance recovery
15 control elapsed time point, as a start time point of the
16 convergence phase, at which the controlled variable does
17 not exceed the set point in the follow-up phase;

18 a third phase switching unit which switches to
19 the stable phase at a time point, as a start time point
20 of the stable phase, at which a preset state is reached
21 in the convergence phase;

22 a first manipulated variable determining unit
23 which continuously outputs a manipulated variable which
24 makes the controlled variable follow up the set point in
25 the follow-up phase;

26 a second manipulated variable determining unit
27 which continuously outputs a manipulated variable which
28 makes the controlled variable converge near the set
29 point in the convergence phase; and

30 a third manipulated variable determining unit
31 continuously outputs a manipulated variable which makes
32 the controlled variable stable at the set point in the

33 stable phase.

9. A feedback control device according to
2 claim 8, characterized in that said first phase
3 switching unit sets a time point, as the start time
4 point of the follow-up phase, at which it is confirmed
5 on the basis of a deviation between a set point and a
6 controlled variable that a disturbance has been applied.

10. A feedback control device according to
2 claim 8, characterized in that said first phase
3 switching unit sets a time point, as the start time
4 point of the follow-up phase, at which a phase switching
5 signal is input from an external unit which notifies
6 application of a disturbance.

11. A feedback control device according to
2 claim 8, characterized in that said second phase
3 switching unit calculates a predicted value of a
4 remaining time for attainment which is a time taken for
5 a current controlled variable to reach the set point in
6 the follow-up phase, on the basis of a deviation between
7 the set point and the controlled variable and a
8 controlled variable change ratio, and sets a time point,
9 as the start time point of the convergence phase, at
10 which the calculated predicted value of the remaining
11 time for attainment becomes smaller than a preset time
12 index.

12. A feedback control device according to
2 claim 8, characterized in that said third phase

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3 switching unit sets a time point, as the start time
4 point of the stable phase, at which a preset time index
5 has elapsed.

13. A feedback control device according to
2 claim 8, characterized in that said manipulated variable
3 determining unit continuously outputs a preset
4 manipulated variable.

14. A feedback control device according to
2 claim 8, characterized in that said second manipulated
3 variable determining unit continuously outputs a preset
4 manipulated variable.